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EEP 18-19

REPORT TO CORE AREA LIQUID WASTE MANAGEMENT COMMITTEE
MEETING OF WEDNESDAY, MAY 9, 2018

SUBJECT **Disinfection at McLoughlin Wastewater Treatment Facility**

ISSUE

The Core Area Liquid Waste Management Committee (CALWMC) requested an update on the implications for including disinfection treatment at the McLoughlin Point wastewater treatment plant.

BACKGROUND

The Capital Regional District (CRD) is constructing a wastewater treatment plant at McLoughlin Point to meet commitments made in the Core Area Liquid Waste Management Plan (LWMP) Amendment No. 11, with conditional approval received from the Province on November 18, 2016. The treatment plant, and associated system upgrades, will ensure the CRD meets both provincial and federal regulatory requirements to treat core area wastewater, as laid out in the current LWMP.

Disinfection is a level of treatment above and beyond the tertiary level planned for the facility; it is used to further reduce human health risk associated with the bacteriological components of wastewater. This has implications for recreational and fishery uses of the receiving environment. Disinfection would not address risks associated with stormwater flows along the nearshore, and is not required as part of the CRD's current provincial regulatory commitments. However, the facility is designed with enough space to install disinfection works should they be required in the future. The CRD is also implementing a long-term Inflow and Infiltration (I&I) plan to reduce flows in the wastewater conveyance system, and the success of that plan will inform future regulatory direction.

The effectiveness of disinfection is dependent upon the flow volumes that can be handled in the new system. The majority of the flows will go through the new plant and receive tertiary treatment, but some seasonal flows will not be subject to full treatment. Based on average dry weather flows (ADWF), the McLoughlin Point plant will treat all flows up to 2xADWF to a tertiary level (i.e., primary + secondary + tertiary) and discharge effluent through the new outfall. Flows beyond 2xADWF and up to 3xADWF flowing through the Clover Point pump station and 4xADWF from the Macaulay Point pump station will be treated at McLoughlin to a primary level and blended with the tertiary 2xADWF effluent. This will result in a final combined effluent that is equivalent to at least secondary level prior to discharge through the new outfall.

Any flows that exceed 3xADWF at Clover Point and 4xADWF at Macaulay Point will only be screened and then discharged from the existing outfalls. On the Clover side of the system, this means some overflows will continue on a regular annual basis leading up to 2030, when substantial I&I reduction efforts are fully implemented. On the Macaulay side, I&I issues are much less significant, and overflows will only typically occur for storms greater than a 5-year return period. As a result, overflows will still occur occasionally at Clover and Macaulay points; these overflows will not receive full treatment, including disinfection, if it were installed, and will result in some human health risk.

With respect to other coastal communities, the Regional District of Nanaimo does not have disinfection, but is providing space for future consideration at its French Creek facility as part of upcoming upgrades. Metro Vancouver provides seasonal disinfection (May-September) for all but one of its outfalls to address locations where recreational use is present within the Fraser River and north shore beaches.

PUBLIC HEALTH AND ENVIRONMENTAL IMPLICATIONS

Current risks to human health from the Macaulay and Clover outfalls are low. The outfalls discharge offshore and typically below the surface, limiting the potential for human contact where the human health guidelines are exceeded. There is also a 100m initial dilution zone around the outfall terminus with limited exceedances at the ocean's surface beyond that perimeter. As well, there is a bivalve shellfish (e.g., clams, mussels, oysters, etc.) sanitary closure in place to prevent exposure from harvesting and consumption (Appendix A).

The CRD monitors the marine environment around the outfalls for regulatory compliance and also monitors near-shore stormwater discharges and sanitary sewer overflow locations. Weather events often result in exceedances of water quality guidelines, leading to temporary closures of beaches in the core area. This is often due to power failures or overflows from pump stations along the sanitary sewer system, as well as stormwater discharges. Wastewater outfall discharges typically do not reach the nearshore, and extended duration beach closures are typically due to stormwater sources.

Tertiary treatment at the McLoughlin Point facility will reduce the risk of bacterial contamination by 2-3 orders of magnitude below the levels associated with the current discharges. Without disinfection, there will still be exceedances of human contact guidelines around the new McLoughlin outfall terminus. With disinfection, bacterial concentrations would be below these guidelines around the McLoughlin outfall and would reduce the already low risk associated with recreational exposure. However, there will remain some residual (low) risk during the wet weather overflow events.

INTERGOVERNMENTAL IMPLICATIONS

Bivalve shellfish harvesting around the Macaulay and Clover outfalls is currently closed based on federal policy. First Nations provided input regarding areas where they have the greatest interest in shellfish harvesting, both inside and outside the existing sanitary closure. These areas were taken into consideration when predicting the future bacteriological impacts of the new McLoughlin Point outfall and upstream components of the system, including the Macaulay and Clover wet weather flows.

Many of the shellfish areas identified by First Nations are located along the shoreline; these areas will remain closed regardless of whether disinfection is installed at McLoughlin Point because of the influence of stormwater discharges. Swimming scallops were also identified as a resource, by First Nations and others, in the vicinity of the outfalls. The Macaulay and Clover wet weather flows will continue to impact these more mobile bivalves, as well, likely precluding any significant reduction in sanitary closure size around the new and existing outfalls.

First Nations expressed concern regarding crab and finfish harvesting near the outfalls. Wastewater bacterial risk to humans is negligible when consuming these types of organisms, as they do not accumulate bacteria in the same way as bivalve shellfish.

There were some areas identified by First Nations that are outside of the existing sanitary closure, but may be impacted by the present day discharge through the Macaulay and Clover points outfalls. The new treatment regime, of McLoughlin discharging wastewater with bacterial levels 2-3 orders of magnitude lower than present day and Macaulay and Clover discharging much lower volumes and only intermittently, will substantially reduce the shellfish bacteriological risk in these more distant areas. However, it is the wet weather discharges through the Macaulay and Clover points outfalls that will continue to generate the very slight risk to these areas in the future. The Macaulay and Clover wet weather flows cannot be disinfected and, as such, the installation of disinfection at McLoughlin Point would not completely eliminate the risk.

FINANCIAL IMPLICATIONS

The installation of disinfection (advanced ultraviolet and oxidation) at McLoughlin Point would cost $3.9 million and would require an additional operating budget of $80,000 per year (Class C estimate). The existing core area sewage treatment project budget does not include funds for this work, and any such works would be out-of-scope with respect to current construction contracts for the McLoughlin Point facility.

REGULATORY IMPLICATIONS

Wastewater discharges are regulated through the BC Municipal Wastewater Regulation (MWR), under the provincial *Environmental Management Act*. Approved LWMPs are used to implement a compliance plan to meet the regulatory goals. The discharges are also regulated by the federal Wastewater Systems Effluent Regulations under the *Fisheries Act*. The senior levels of government continue to proceed with harmonization of the overall regulatory framework.

The MWR stipulates that shellfish bacteriological water quality guidelines be met within 100m of a wastewater outfall. Although not a requirement of the current LWMP, the Ministry of Environment can at any time reevaluate its requirements and impose disinfection to meet this guideline. Regardless, disinfection could not be implemented for the Macaulay and Clover points outfalls during wet weather events because of the high organic matter in these screened, but untreated, flows. The approved Core Area LWMP does not include provisions for disinfection at McLoughlin and does allow for the Macaulay and Clover wet weather flows to continue. However, the Core Area LWMP does contain commitments to undertake conveyance system capacity upgrades and implement municipal I&I reduction efforts that will reduce the frequency, duration and volumes of wet weather flows.

LWMPs are a mechanism by which MWR water quality guideline requirements can temporarily, but not permanently, be exceeded. Long-term LWMP commitments must eventually achieve full compliance with the MWR. However, even if Core Area LWMP I&I and wet weather management commitments fully eliminate municipal wastewater overflows and disinfection is installed for the McLoughlin outfall, bacteriological risks will still exist due to the continued presence of stormwater input to the nearshore.

CONCLUSIONS

Human health and environmental risks associated with bacteria in current wastewater discharges from the Macaulay and Clover points outfalls are low, and will continue to be low in the future, regardless of whether disinfection is installed at McLoughlin Point for the new outfall. Treatment at the McLoughlin Point plant will significantly reduce bacterial concentrations in the effluent but a slight risk will remain, due to the occurrence of wet weather flows through the Macaulay and Clover outfalls, which cannot be disinfected.

The approved LWMP allows for future wet weather discharges through the Macaulay and Clover outfalls. The CRD is implementing an approved long-term I&I reduction plan intended to substantially reduce or eliminate these overflows by 2030. The success of these efforts will likely inform future regulatory direction.

Shoreline shellfish harvesting closures are expected to remain into the near future, regardless of whether disinfection is installed at McLoughlin, as stormwater impacts predominate along the shoreline. Offshore harvesting closures are unlikely to change substantially, regardless of whether disinfection is installed at McLoughlin, also due to the expected Macaulay and Clover flows.

RECOMMENDATION

That the Core Area Liquid Waste Management Committee recommend to the Capital Regional District Board:

That this report be received for information.

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CL:cam

Attachment: Appendix A – Department of Fisheries and Oceans – Sanitary Closure Areas